

## **ABSTRACT OF THE DISCLOSURE**

5        A system for storage and retrieval of elemental hydrogen on a silicon substrate. The hydrogen storage members have at least one surface to which elemental hydrogen either readily bonds or into which the elemental hydrogen is readily adsorbed, and from which desorption of the elemental hydrogen may be controlled. The silicon may be monocrystalline or polycrystalline and may be formed as sliced wafers, as very fine  
10 extruded columns, or may be derived from waste in the manufacture of integrated circuits. The silicon surfaces may be treated in a variety of ways to increase porosity and surface area, and thus to increase storage efficiency for elemental hydrogen. The system is useful in supplying fuel to a fuel cell system for generating electric power, as well as for cooperating with a control system to form a stand-alone Auxiliary Power Unit.